

Integrating Veterinary & Public Health Surveillance: Montana Case Study

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Emergency Preparedness and Response for Bioterrorism

A Proposal in Response to CDC Program Announcement 99051

The specter of bioterrorism has risen in our society to present a threat that can no longer be ignored. This threat presents new and daunting challenges to officials across a wide range of the public service sector. Proper response preparedness will require not only close communication and coordination among civil response and law enforcement officials, but also must necessarily include the formation of new partnerships and involvement with the public health and medical community.

Emergency responders traditionally are trained and experienced in dealing mainly with natural disasters (e.g., earthquakes, floods, fires, droughts, tornados) and certain technologic disasters (e.g., hazardous material spills, bomb blasts, chemical explosions); situations in which there exists a readily-apparent initiating event and an identifiable incident scene. Unlike explosions or chemical releases, a bioterrorist attack could be surreptitious; infecting people en masse without notice. Such an occurrence would not present as a hazmat-type incident for which today's civil defense workers are prepared to respond to. The incident would present first and foremost as a medical and public health emergency.

In the event of a covert terrorist release of a biological agent, the first responders will not be policemen, firemen and EMT's, but rather primary care providers in emergency rooms and walk-in clinics. The response to covert bioterrorist attack is unlikely to involve flashing red lights and sirens, but rather clinicians and nurses doing triage, and public health workers doing epidemiology, outbreak intervention and disease surveillance. Symptoms among victims might not occur until days or weeks after infection, and those presenting to physicians and clinics would not all be in the same place. A strong public health network would be needed to piece together early reports of disease, and to determine quickly what had happened. It will be the medical or public health worker who will likely sound the "first alarm" in the event of a bioterrorist incident.

Health workers should undertake to ensure that the alarm is sounded as soon as possible. Time is of the essence, especially in situations involving agents such as anthrax, in which

antibiotic treatment is efficacious only if given shortly after the onset of symptoms. How quickly an incident is detected, analyzed, understood and addressed will determine the effectiveness of the medical and public health response. Surveillance systems must adapt to the changing needs of society. Efforts should be directed toward improving our current surveillance system in order to more quickly detect a bioterrorist incident based on the appearance of disease symptoms.

Nationwide, communicable disease surveillance systems today are driven by reports that are primarily based on laboratory findings. Furthermore, the diseases that are traditionally reported are only those specifically designated as notifiable and appearing on an exclusive list maintained by a state health department. While most state health department regulations also call for the reporting of "any unusual illness or cluster of illness", clinicians are unaccustomed to reporting unusual illness, and generally opt to defer reporting (assuming they report at all) until after a specific diagnosis has been made. And a cluster of illness can not be expected to be recognized by clinicians since cases of disease during an outbreak may be widely separated geographically, and appear to an individual clinician to be an isolated or sporadic occurrence.

The U.S. Centers for Disease Control and Prevention has stated that effective surveillance and epidemiologic capacity are the foundation for health departments to detect, evaluate and respond to terrorist events. The rapid detection of acute or insidious terrorist attacks using biological agents will require effective linking of data from a variety of sources, and that an effective public health response will depend on the quality of communications among partners. Complementing the need for accurate and timely case reports is the need for expertise to analyze the information properly. Timely and accurate information and analysis must be coupled with effective and rapid dissemination of information of those who need to know.

Of the twenty-two U.S. states located west of the Mississippi River, only five are not included in Nunn-Lugar-Domenici legislation addressing the threat of bioterrorism. These five states are clustered contiguously in the north-central region of our country, and consist of Idaho, Montana, North Dakota, South Dakota and Wyoming. They collectively comprise almost fifteen percent of our country's land mass. Each state is similar in being characterized as rural and frontier.

The threat of bioterrorism extends even to rural, frontier states. While the states of Idaho, Montana, North Dakota, South Dakota and Wyoming are most certainly not a high priority target for foreign, state-sponsored terrorist, they are not, by any means, at "no-risk", or even necessarily at "low-risk" of incident. The remoteness of these states and their sparse population, which likely serve as a "turn-off " for international terrorists, seem to hold a certain appeal for domestic terrorist elements, e.g., unabombers, capitol shootists, Freeman, Aryans, survivalists, militiamen, skinheads, klansmen, skinheads, religious cult extremists, and anti-government radicals. It might serve well to remember that all of the major bioterrorist incidents recorded in the U.S. during contemporary times (ie., the Rajneeshi's and the Minnesota Patriots) were perpetrated not by foreign, state-sponsored terrorist, but by legal residents for political purposes. The bioterrorist threat to homeland America does not originate only from outside our nation, but also, and perhaps more importantly, from within.

The five states of Idaho, Montana, North Dakota, South Dakota and Wyoming jointly propose to develop and implement a regional strategem for strengthening local and state public health capacity to respond to bioterrorist threats by improving on existing capacity, and developing new capacity, for gathering and evaluating disease surveillance data. An important element of the plan will be the inclusion of animal disease data.

Animals have long served mankind as "canaries in the coal mine". The utility of animals as sentinels of human disease is well established. Many of the microorganisms available for use as weapons by terrorists are zoonotic disease agents. A wide range of wild and domestic animals are susceptible to infection with the agents in a bioterrorist arsenal. Some animals, in fact, are even more susceptible to infection with certain agents and would serve as an more sensitive and rapid indicator of a bioterrorist incident. Animals outnumber humans in the region by a very large margin, and can potentially be a very valuable source of disease intelligence, possibly even serving to function as an early warning system to signal the occurrence of an incident.

Animal health officials, epidemiologists and several medical officers from each of the above five states have expressed interest in undertaking to pioneer a model system of regional surveillance for incidents of unexplained critical illness in man and animals. The system would serve to function as an early-warning and detection system based on the appearance of disease symptoms, not laboratory findings. Such a system would serve

functionally as a **regional disease intelligence center**. If properly designed, it could serve as a model system for other rural, frontier states.

Maximum use would be made of modern communication technology to create an electronic repository of information from a network of human and animal health providers. Input to such a **regional disease intelligence center** would be provided by a wide variety of human and animal health care resources throughout the area including primary care physicians, practicing veterinarians, walk-in clinics, hospital emergency room staff, game wardens, EMS responders, poison control centers, humane societies, local and county public health departments, community health centers, medical examiners, animal shelters, county coroners, phone-in "ask-a-nurse" services, 911 dispatchers, etc. Communication tools to be used in such a system would include a custom-designed telephone answering and recording system; a specially-created, restricted-access web site for deposition of data; and a dedicated E-mail listserve group.

Complementing the need for timely and accurate case reports is the need for expertise to analyze the information properly. This capacity would be provided by each and every state involved in the project. An important feature of the system would be that all of the data in the system would be remotely and immediately available to authorized individuals from each of the five states. Authorized individuals would likely include state epidemiology staff, state animal health officials and state medical officers, and others as needed. Timely and accurate information analysis must then be coupled with effective and rapid dissemination of information to those who need to know.

**PROGRAM ANNOUNCEMENT 99051
PUBLIC HEALTH PREPAREDNESS AND RESPONSE FOR BIOTERRORISM**

Focus Area #2 - Surveillance and Epidemiologic Capacity

Executive Summary

The epidemiology staff of the state health agencies in Idaho, Montana, North Dakota, South Dakota and Wyoming jointly propose to conduct regional disease surveillance, and to collaboratively enhance epidemiologic capacity in response to the threat of bioterrorism. A major innovative feature of the proposal is surveillance for animal diseases, and integration of the data

into existing communicable disease surveillance infrastructure. To accomplish this, we propose to create a new, strong partnership with the veterinary medical community. We also propose to begin acquiring disease intelligence from other unconventional sources including poison control centers, 911 dispatchers, game wardens, animal shelters, medical examiners, coroners, phone-in Ask-a-nurse services, etc. The most significant feature of the proposal, however, is a plan to initiate surveillance based on the appearance of unexplained, acute illness and early-stage disease symptoms. This activity will increase the sensitivity of a surveillance system and improve its ability to rapidly detect not only a bioterrorist incident, but also naturally occurring disease outbreaks. To enhance epidemiologic capacity, we propose to form an alliance among epidemiology staff of the five state health agencies. Importantly, state veterinary officials involved in herd health will also be included in the alliance. This force of human and animal healthcare workers will be responsible for monitoring reports and analyzing findings resulting from the expanded surveillance activities. To facilitate information flow and safeguard security, maximum use will be made of modern communication technology. If properly designed and pioneered, the proposed initiative could serve as a model for use in other rural or frontier states.

Evaluation Criterion 1. Description of the Population and Jurisdiction Under Surveillance

The jurisdiction covered by the proposed activities includes the five U.S. states of Idaho, Montana, North Dakota, South Dakota and Wyoming. These states are clustered contiguously in the north-central region of our country. Together they comprise over 470,000 square miles and cover about 17% of the total land mass of the lower 48 states. The population count, density and distribution of these states are summarized in Table 1. It can be noted that all of the states are similar in being very rural. In each of the five states, fewer than half of the counties exceed a population density of six persons per square mile, causing all of them by federal definition to be a frontier state. Typical of frontier states, many residents live in medically-underserved communities. Each of the five states are fairly homogenous with respect to minority populations. The largest minority population in the region is the Native American and Hispanic.

Table 1. Population Characteristics; Idaho, Montana, South Dakota, North Dakota & Wyoming

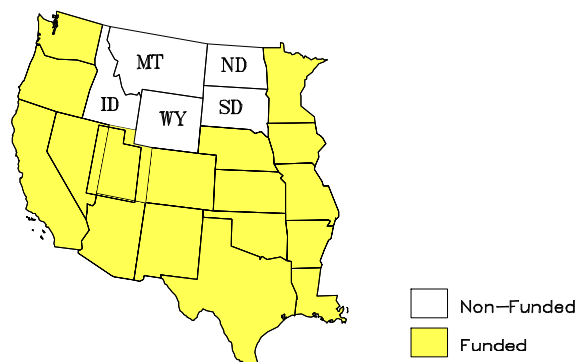
State	Population (1990 Census)	Land Area (Sq. Miles)	Pop Density (Pop/Sq. Mi.)	Rural Pop (Percent)	Minority Pop (Percent)
Idaho	1,006,749	82,751	12.2	69.0	3.3
Montana	799,065	145,556	5.5	76.4	7.4
North Dakota	638,800	68,994	9.3	57.6	5.8
South Dakota	696,004	75,896	9.2	66.9	9.8
Wyoming	453,588	97,104	4.7	70.4	4.1
Total	3,594,206	470,301	7.6	68.4	5.3

Animals in this five state region greatly outnumber humans. In Montana and Wyoming, registered cattle alone outnumber people by greater than a 3:1 margin. When other domestic animals such as horses, sheep, swine, cats and dogs are included in the count, the margin becomes much greater. If one adds to this the vast array of wild animal species, the vertebrate biomass attributable to humans in the region becomes dwarfed by animals.

There exists only five U.S. states west of the Mississippi River that are not included in Nunn-Lugar-Domenici legislation addressing the threat of bioterrorism (Figure 1). These five states are Idaho, Montana, North Dakota, South Dakota and Wyoming: the very states proposing herein to jointly enhance surveillance and epidemiologic capacity under CDC Program Announcement 99051, Public Health Preparedness and Response for Bioterrorism.

Evaluation Criterion 2. Description of Existing Public Health Capacity to Respond to Bioterrorism

Each of the five states are legislatively mandated to conduct surveillance for the prevention and control of communicable diseases. The various diseases and conditions required to be reported are specified in administrative rules of the individual state. The official list of notifiable diseases and conditions for each state appears in Appendix I. The priority disease threats of anthrax, plague, tularemia, botulism, brucellosis and Q-fever are reportable conditions in each of the five states.



**Figure 1. Distribution of Nunn-Lugar-Domenici Funds
Among States in the Western U.S.**

Summary descriptions of each state's existing public health capacity to respond to bioterrorism threats are presented in Appendix II. Described therein are current surveillance and response activities in each state, along with a description of interactions and relations between each state and their local public health agencies. The summaries also provide information on existing staffing, management, financial support, material and equipment investment, training, space, and previous collaborative relationships with health care partners.

Evaluation Criterion 3. Identification of Areas of Need

Officials in the states of Idaho, Montana, North Dakota, South Dakota and Wyoming have identified the following needs with respect to surveillance and epidemiologic capacity: 1) greater awareness of the threat of bioterrorism and the role of epidemiology, 2) higher-sensitivity surveillance techniques, 3) alliance with the veterinary medical community, 4) new and unconventional partnerships, 5) modern communication technology for rapid receipt and dissemination of disease intelligence, and 6) enhanced capacity for epidemiologic analysis of disease data.

Need #1 - Greater Awareness of the Threat of Bioterrorism, and

the Role of Epidemiology

Effective surveillance for bioterrorism will be difficult without an awareness of the threat among those who would be expected to report suspect incidents. A requisite for surveillance is recognition of the need for it. Persons unaware of the threat and its seriousness would not be motivated to respond to the threat. There exists a need to heighten the level of awareness among appropriate groups of people such as health care providers, veterinarians, civil defense workers, law enforcement officers and emergency responders. The degree to which such individuals are alert to the threat of bioterrorism will determine the effectiveness of surveillance activities.

The threat of bioterrorism extends even to rural, frontier states. While the states of Idaho, Montana, North Dakota, South Dakota and Wyoming are certainly not likely to be high priority targets for foreign, state-sponsored terrorists (although we are home to the majority of our nations land-based nuclear missile launch sites), we are not, by any means, at no-risk, or even at low-risk of incident (Table 2). The remoteness of our states and their sparse population seem to hold an appeal for domestic terrorist elements such as unabombers, freemen, capitol shootists, local militias, survivalists, aryan, skinheads, the klan and other white supremacist groups, religious cultists, animal rightists, ecoterrorists, antivivisectionists, right-wing extremists and anti-government radicals. It might serve well to remember that all of the major bioterrorist incidents recorded in the U.S. during contemporary times (ie., the Rajneeshi's and the Minnesota Patriots) were perpetrated not by foreign, state-sponsored terrorists, but by legal residents for political purposes. The bioterrorist threat to homeland America does not originate only from outside our nation, but also, and perhaps more importantly, from within. It is critical that persons-at-need recognize and appreciate the depth and breadth of the bioterrorist threat.

**Table 2. Examples of Terrorist Incidents & Threats
in the Region: Past and Present**

Ruby Ridge Theodore Kaczynski Eugene Russell Weston Freemen Aryan Nation Ku Klux Klan
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Phineas Priesthood Posse Comitatus

There is little experience in the U.S. responding to incidents involving biologic weapons of mass destruction. It is unlikely that a bioterrorist incident will unfold like the disaster and emergency situation civil response workers are accustomed to. Emergency responders traditionally are trained and experienced in dealing mainly with natural disasters (e.g., earthquakes, floods, fires, droughts, tornados) and certain technologic disasters (e.g., hazardous material spills, bomb blasts, chemical explosions); situations in which there exists a readily-apparent initiating event and an identifiable incident scene. Unlike explosions or chemical releases, a bioterrorist attack could be surreptitious; infecting people *en masse* without notice. Such an occurrence would not present as a hazmat-type incident for which today=s civil defense workers are prepared to respond to. The incident would present first and foremost as a medical and public health emergency.

In the event of a covert terrorist release of a biological agent, the first responders will not be policemen, firemen and EMT=s, but rather primary care providers in emergency rooms and walk-in clinics. The response to covert bioterrorist attack is unlikely to involve flashing red lights and sirens, but rather clinicians and nurses doing triage, and public health workers doing epidemiology, outbreak intervention and disease surveillance. Symptoms among victims might not occur until days or weeks after infection, and those presenting to physicians and clinics would not all be in the same place.

A strong public health network is needed to piece together early reports of disease, and to determine quickly what had happened. It will be the physician, veterinarian or epidemiologist who will most likely sound the alarm in the event of a bioterrorist incident. The response would likely begin with a medical and epidemiological investigation to determine the causative agent, source of infection, mode of transmission, measures for control, populations at risk, etc. Law enforcement and civil defense will be looking to the health and medical community for answers to many questions. There is a need for the epidemiology profession to secure a seat at the planning table, and to assume the leadership role that will be expected of them in the event of a bioterrorist incident.

Need #2 - Higher-Sensitivity Surveillance Techniques

Since medical, veterinary or public health workers will likely sound the first alarm in the event of a bioterrorist incident, these workers should undertake to ensure that the alarm is sounded as soon as possible. Time is of the essence, especially in situations involving agents such as anthrax, in which antibiotic treatment is efficacious only if given shortly after the onset of symptoms. How quickly an incident is detected, analyzed, understood and addressed will determine the effectiveness of the medical and public health response. Surveillance systems must adapt to the changing needs of society. Improvements need to be made in surveillance systems in order to more quickly detect not only bioterrorist incidents, but also cases and clusters of illness due to naturally-occurring disease or emerging, new pathogens.

Bioterrorist incidents are expected to be extremely uncommon occurrences. When undertaking surveillance for rare events, the premium should be placed on sensitivity,....not specificity. This becomes particularly important when dealing with high-impact events such as the release of biological or chemical weapons of mass destruction; the consequences of missing a true positive report in the event of an actual incident are much more serious than receiving false positive reports in the absence of an actual incident. The early identification of low-probability/high-consequence events calls for surveillance mechanisms which maximize sensitivity.

The sensitivity of surveillance for emerging new pathogen or bioterrorist incidents can be improved by undertaking surveillance based on the appearance of disease symptoms. Many new infectious diseases identified in the U.S. during the last several decades were recognized through investigations of illness for which no cause had been determined. Surveillance for incidents of unexplained, acute illness due to possibly infectious causes may make possible the earlier recognition of new infectious agents occurring either naturally or unnaturally.

Nationwide, communicable disease surveillance systems are driven primarily by reports that are based on laboratory findings. The diseases reported are traditionally those specifically designated by the state as notifiable. While most state health department rules/regulations also call for the reporting of any unusual illness or cluster of illness, clinicians are unaccustomed to reporting unusual illness, and generally opt to defer reporting

(assuming they report at all) until after a specific diagnosis has been made....and a cluster of illness cannot always be expected to be recognized by clinicians since cases of disease during an outbreak may be widely separated geographically, and appear to an individual clinician to be sporadic or isolated occurrences. The addition of surveillance measures based on disease symptoms to existing infrastructure would begin changes needed to bring public health surveillance into the 21st century.

Need #3 - Alliance with the Veterinary Medical community.

It is essential to avoid creating an arbitrarily narrow premise in the strategic planning process for bioterrorism preparedness. A working definition of bioterrorism is the use of biological agents to intentionally produce disease in **susceptible populations**. No distinction is made between subsets of susceptible populations. Domestic and wild animals, or even cultivated plants, are potential targets of the bioterrorist.

Modern biological warfare was first directed against livestock. Agents of the Central Powers disseminated the causative organism of glanders, *Burkholderia mallei*, throughout stables of horses mules during World War I, in order to paralyze troop and munitions mobility. The Japanese effectively directed the same agent against both horses and troops in World War II.

Animals could be a compelling target of bioterrorism. They could serve to provide a test population on which to conduct a dry run before targeting a human population. Alternatively, a terrorist may consider a biological attack on animals to be a safer venture than humans, and simply direct their attack on a population of animals to further their own particular goals. The agricultural industry is notoriously fragile; a terrorist attack using a contagious foreign animal disease could conceivably devastate the industry and regional economy. In this age of militant animal activists, an assault on our agricultural base is unfortunately a valid concern. Also, with high-profile, emotionally-charged, contentious issues such as the management of brucellosis in the Yellowstone National Park bison herd, a bioterrorist attack with an agent such as *Brucella abortus* is not inconceivable.

Animals have long served mankind as canaries in the coal mine. The utility of animals as sentinels of human disease is well

established. Most bioterrorist weapons are zoonotic disease agents. A wide range of wild and domestic animals are susceptible to infection with these agents. The incubation period of several agents is sometimes accelerated in animals. Some animals, in fact, are even more susceptible to infection with these agents, and would serve as an more sensitive and rapid indicator of a bioterrorist incident. Animals outnumber humans in the region by a very large margin, and can potentially be a very valuable source of disease intelligence, possibly even serving to function as an early warning system to signal the occurrence of an incident.

The recent outbreak of Hendra-like Virus among pigs in S.E. Asia resulting in 111 human deaths illustrates the need for strengthening partnerships with the veterinary medical community. A surveillance system for bioterrorist incidents could be enhanced by concomitant monitoring of unexplained diseases in animals due to possibly infectious causes. The coordination of veterinary and human health surveillance activities would serve to strengthen to epidemiologic capacity to respond to threats posed by, both, zoonotic diseases and bioterrorism.

Need #6 - New and Unconventional Partnerships

The specter of bioterrorism presents new and daunting challenges to officials across a wide range of the public service sector. Proper response preparedness will require not only close communication and coordination among the public health, medical and veterinary communities, but also must necessarily include the formation of new partnerships and involvement with law enforcement, civil defense and military officials.

Evaluation Criterion 5. Operational Plan - Description of First Year Activities

The five states of Idaho, Montana, North Dakota, South Dakota and Wyoming propose to conduct regional surveillance for incidents of unexplained acute illness in man and animals. This activity would augment current surveillance mechanisms and gradually be integrated into the existing infrastructure of each state health department. The system would be designed to provide early-warning and detection of disease outbreaks based on the appearance of certain disease syndromes. If properly designed and pioneered, it could serve as a model system for other rural, frontier states.

*Why **regional** surveillance?*

1.) Pathogenic microbes neither recognize state boundaries nor respect health jurisdictions.

2.) In surveillance, (like fishing), larger nets produce greater catches.

3.) The 5 states all share similar demographic, cultural and environmental characteristics.

4.) The 5 states are all without Nunn-Lugar-Domenici funds

5.) Combining efforts in response to limited resources can mutually benefit collaborating states

6.) Health workers in the region have a close collegial relationship and a history of successfully working well together.

A diagram of the operational plan appears in Figure 2. As shown in this diagram, we are proposing to establish a regional network of providers of unconventional disease data to supplement traditional surveillance activities. Sources of such data include veterinarians, animal clinics, poison control centers, game wardens, medical examiners, coroners, phone-in ask-a-nurse services and 911 dispatchers. Workers from these sources would be encouraged to make notice of incidents of unexplained acute illness among man and animals due to possibly infectious causes, and to report such incidents using a custom-designed, 24-hour, toll-free, region-wide telephone reporting system.

Reporting of incidents via the regional phone line would be voluntary. This would obviate the need to initiate lengthy and often uncertain attempts at official changes of rules or regulations governing disease reporting in the state. The decision to make reporting voluntary is not anticipated to negatively impact the outcome of the initiative. It is the experience of state epidemiologists that disease reporters are not motivated by force of law, but rather by information, education and understanding. Thus, an important element of the proposal, and one that is essential to the success of the initiative, would be for state officials in the region to fully and appropriately inform prospective reporters of the need for and importance of their involvement in this surveillance activity.

The technical capability to collect telephone reports and to provide immediate, remote access to the information already exists, and can be acquired through the Montana Department of Administration, Division of Information Services. Professionals in this agency would assist us in system design and development, and also be responsible for technical maintenance of the system when operational. The phone number 1-800-DISEASE is available for our choosing.

The 1-800-DISEASE telephone line is **NOT** proposed to function as an emergency hotline. It is proposed to serve merely as a data-gathering device and epidemiologic tool: a mechanism for acquiring information in order to identify communicable disease problems before they become manifest to the general public as an emergency. It must be realized that a disaster and emergency situation, as we know it, will not develop until days or weeks after an incident, and that it will likely unfold insidiously. The critical time to get phone calls coming through 1-800-DISEASE is before any problems are apparent: for when the brunt of an incident comes to bear, the time period for early detection will have passed. The purpose for the proposed phone line is not to receive emergency call, but rather to acquire data to determine if emergency calls should be initiated.

Callers to 1-800-DISEASE would always have the option of speaking to a live person. Such a person could be provided by the Montana Department of Military Affairs, Division of Disaster and Emergency Services; they have trained, emergency response duty officers manning their phone around-the-clock. In the event of an emergency call requiring immediate attention by a state or local health department, the duty officer would notify appropriate officials in the state of origin of the call, as specified by a call-down list that would be provided to the duty officer beforehand by each participating state. Since bioterrorist incidents and large communicable disease outbreaks are expected to be uncommon occurrences, emergency calls to the phone line should be rare. Most calls would be to report an individual incident of unexplained acute illness. These calls would need to be monitored on a regular basis and analyzed for evidence of a larger problem. It would be up to each state and their surveillance staff, epidemiologists, medical officers, and animal health workers to continually monitor calls to see if the individual reports can be pieced-together into some bigger picture. Since most call into the system would be expected to be reports of individual incidents of a non-emergent nature, and for which immediate attention and rapid follow up by state or local officials is not necessary, callers would have the option of filing a voice-recorded report. So long as such reports would be accessed regularly and in a timely fashion, this method of information capture could suitably serve the designed purpose of the system.

We propose to sustain these surveillance activities using current level staffing. It would be difficult to justify a full-time position responsible specifically and solely for bioterrorism

surveillance. We propose to integrate these activities into current surveillance infrastructure, and for the duties to be accomplished using existing resources.

Enhanced epidemiologic capacity would be achieved by joining forces with human and animal health officials in each of the five states in the region. We propose to create an alliance of state epidemiology staff, state veterinary officials, state medical officers, and others as needed. This taskforce would have immediate and remote access to incident reports received via 1-800-DISEASE, and they would be responsible for ensuring that reports are monitored on a regular basis. The regional taskforce would collectively provide the expertise needed to epidemiologically analyze the information. Individual states would be responsible for follow up and disposition of phone calls originating from within their jurisdiction.

- Network of information providers
- Unconventional sources of disease data
- Supplements traditional surveillance
- Identify incidents of unexplained illness among man and animals
- Telephone reporting system
 - 24-hour, toll-free, region-wide
 - Voice message recording capability
 - Live person option for emergencies
 - Joining of forces to enhance epi capacity
 - Alliance of animal and human health workers
 - Officials in 5 states to monitor reports
 - Remote, immediate access to incident reports
 - Individual states responsible for follow up and disposition of phone calls originating from within their jurisdiction
- Secure, restricted-access, internet web site
- Web site to house disease intelligence database
- Access limited to authorized state workers
- Database to contain record of phone reports
- Database to also contain follow up findings
- Database input only by state officials
- CDC to be asked to assist in database design
- Daily analysis of data by regional epi taskforce

Overview of Proposed Activities

1. Develop a multimedia presentation addressing the threat of bioterrorism in frontier America; deliver to groups of workers who

have a need-to-know

- to be developed collaboratively by workers in each state
- will serve need to inform, to educate & to raise level of awareness
- intent is to help build needed, new partnerships.

2. Establish a network of information providers; include new and unconventional sources of disease surveillance data

- examples include veterinarians, game wardens, poison control centers, humane societies, phone-in ask-a-nurse services, 911 dispatchers, EMS responders, medical examiners, coroners, emergency rooms, walk-in clinics, animal shelters, etc.

3. Set up a region-wide, toll-free, 24-hour phone line to report incidents of unexplained acute illness in man and animals

- integrate this surveillance activity into existing public health infrastructure

4. Organize a multidisciplinary workforce consisting of human health and animal health officials from each state; to be responsible for the daily monitoring and epidemiologic analysis of incident reports

- workers in each state to have immediate and remote access to incident reports
- each state responsible for follow up of incident reports originating from their jurisdiction
- identify situations requiring immediate response actions; individual states responsible for action

5. Put together an e-mail listserve to facilitate communication among workforce members

- each state to determine who they want included on the list from their state

6. Establish a secure, restricted-access web site on the internet so that confidential data files can be easily and safely shared among workforce members

- to provide multi-user capacity for long-distance data entry and retrieval

7. Create a database containing a record of incident reports, critical information and follow up findings

- place file on web site, making it unavailable to general public or unauthorized individuals
- data to be entered only by state government officials, ie., workforce members
- each state responsible for input of data on reports originating from their jurisdiction
- epidemiologic information contained in database to serve as

regional disease intelligence

8. Request that CDC assign an EIS officer to assist in the database design and development.

-CDC is a vital partner in a state's response to the threat of bioterrorism

-to help assure federal objectives are addressed

9. Develop a detailed plan for monitoring the implementation of the proposed activities and for evaluating the extent to which they strengthen local and national surveillance and epidemiologic capacity to respond to the threat of bioterrorism

Integrating Veterinary and Human Health Surveillance

Montana Case Study

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Emerging diseases

- **Emerging Infections: Microbial Threats to Health in the U.S.** Institute of Medicine (1994)

“...new, reemerging, or drug-resistant infections whose geographic range or incidence in humans has increased within the past two decades or whose incidence threatens to increase in the near future.”

- A new disease or a new manifestation of an old disease

CDC's response

- Enhanced surveillance and outbreak response
- Renewed support of basic and applied research
- Strengthen public health infrastructure
- Training and information programs

State and local initiatives

- Rebuild public health infrastructure
- Increase reporting and surveillance capacity
- Dual use
- New partnerships
- Public / Professional awareness

Accelerating emergence Factors

- Reduced public health influence
- Rampant urbanization
- Ecological manipulation
- Global transportation
- Popularity of exotic species
- Expansion of human, reservoir and vector populations
- Changing human susceptibility
- Microbial adaptation

Complacency

- "One can think of the middle of the 20th century as the end of one of the most important social revolutions in history:

...the virtual elimination of the infectious disease as a significant factor in social life."

Sir McFarland Burnet, 1962

Montana's Public Health Response to Domestic Bioterrorism


The Montana Plan

- Interagency communication
- Interdisciplinary communication
- Regional cooperation
- Nontraditional partnerships
- Dual-use

Bioterrorism

- **Definition:** Use of biological agents to intentionally produce disease or intoxication *susceptible populations* to meet terrorist goals
 - Agents: Most are zoonotic
 - Targets: Human and/or animal populations

The terrorist mindset

- Human behavior is purposeful
 - Terrorists are not crazy
 - Agents of Political Change- permission by behavior
 - Political activism
 - Political radicalism
 - Political terrorism- asymmetrical means
 - Low-intensity conflict
 - Conventional warfare
 - Terrorists need a response
- 

Montana?

- the Frontier Mystique
- the Unibomber
- Antigovernment radicals
- Religious cults
- Extremist groups
- Millenium/doomsday cults
- Psychopaths (*Eugene Russell Weston*)
- Antivivisectionists
- Animal rights activists

Infectious disease and public health

- Anthroponotic vs. Zoonotic disease
- Behavior vs. Mother Nature
- Mother Nature vs. Deliberate

Media relations

- Of primary importance when public health or economic interests are threatened
- Success depends on **public good will**
- OBSTACLES:
 - Media frenzy
 - Anti-establishment mood
- GOALS:
 - Inspire public trust and confidence
 - Timely and factual public information
 - Retail vs Wholesale communication

...the nature of a biologic attack

- Silent
- No “point-source event”
- Delayed onset of effect
 - Incubation time
 - Biological response time: SEB
- Interdiction next to impossible
- Detection next to impossible
- Diagnosis takes time
- *First hint of an attack?*

...the nature of a biologic attack

- An unnatural epidemic of an
***EMERGING INFECTIOUS
DISEASE***

...challenges in recognizing a bioterrorist attack

- Delayed onset
- Wide dissemination of cases
- Rarity of the natural disease
- Inadequate passive surveillance
- Communication inadequacies
- Sample recognition and collection
- Diagnostic inadequacies

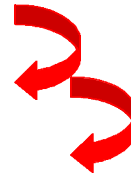
...health care challenges

- Inadequate resources
- Inadequate facilities
- Insufficient therapeutic/preventative stockpiles
- Bioprotection of health care workers
- Panic among the exposed, ill and health care providers
- Sociogenic illness

10 dead

100 affected

1,000 psychosomatic



...playing Clue

- Abnormal incidence of an infectious disease
- Large point-source outbreak
- Simultaneous infectious disease outbreaks
- Abnormal location of an infectious disease
- Animal mortality
- Severe disease in “bullet proof” individuals

Biological Warfare Agents

- Anthrax*
- Smallpox
- Plague*
- Brucellosis*
- Botulism*
- SEB*
- Tularemia*
- Q Fever*
- *Salmonella**
- Cholera
- Equine Encephalitis Virus
- Hemorrhagic Fever viruses

...agricultural bioterrorism

- Biological attack on state/ nation's agricultural industry
- Economically devastating
- Added benefit of zoonosis
- Well within the realm of “environmental terrorists”
- Fallout of human attack?

...foot and mouth disease

- DEFN: Acute, highly contagious viral disease of cloven-hoof animals
- Taiwan, 1927
- California, 1929
- Taiwan, 1997
 - Point source
 - Rapid dissemination
 - >5 million pigs killed

...the New Zealand experience

- August 1997
- Organized, deliberate, illegal introduction of a foreign biological agent against an organized government prevention program
- The Proliferators: NZ farmers

Preparedness

- National
 - Department of Defense
 - FBI and FEMA
 - Office of Emergency Preparedness
 - CDC Atlanta
- State & Local
 - Cooperative between law enforcement, first responder, and human/veterinary health communities
- Civilian Biodefense Program
 - Johns Hopkins grass roots effort

Local preparedness

- First Responders
 - Fire Department
 - Disaster and Emergency Services (DES)
 - HAZMAT units
- Veterinary/human health care officials
- State and local law enforcement
- FBI, FEMA, CDC, and EPA
- USAMRIID

Counterthreat

- Education
- Nontraditional partnerships
- Communication
- Surveillance and reporting
- R&D for biologics and antibiotics
- Rapid diagnostics

Local preparedness

- **EARLY DETECTION & EARLY RESPONSE**
- *ABSOLUTELY depends on ROUTINE local and informal interaction between the “Greater Integrated Public Health Community”*

“Non-traditional Partnerships”



DAKOTA-IDAHO-MONTANA BT SURVEILLANCE TASKFORCE

Montana's Public Health Response to Domestic Bioterrorism

CDCs response: Bioterrorism

- Preparedness Planning and Readiness Assessment *
- Surveillance and Epidemiology Capacity *
- Laboratory Capacity- biologic agents
- Laboratory Capacity- chemical agents
- Health Alert Network / Training *

* *Current MONTANA grants*

CDC's response: Emerging Disease

- Enhanced surveillance and outbreak response
- Renewed support of basic and applied research
- Strengthen public health infrastructure
- Training and information programs

CDC perspective

- “The threat of bioterrorism focuses attention on overall preparedness to address the challenges posed by emerging diseases.”
- “Bioterrorism scenarios illustrate the diversity of disciplines and perspectives required to confront these threats.”
- “The need to strengthen existing and develop new partnerships is clear”

JAMES M. HUGHES, CDC

Preparedness challenges in Montana

- Rural Intermountain West state
- “Bare bones” infrastructure
- Few players
- Inadequate funding for expanding imperatives

Preparedness strengths in Montana

- Self-help culture
- Biggest town in the U.S.
- Few players
- Innovation and cooperation between disciplines

Dual Use

- Gallatin County Community/Public Health Alliance
Turning Point Initiative
- “Create a public health infrastructure that incorporates both traditional and nontraditional partners based on a culture of cooperation.”
- “Create a more integrated public health system that encourages collaboration and coordination of community and state public health resources.”

The Montana Plan

- Interagency communication & cooperation
- Interdisciplinary communication & cooperation
- Regional communication & cooperation
- Nontraditional partnerships
- Dual-use activities

Building trust

- First Responders
 - Police
 - Fire Department
 - Disaster and Emergency Services (DES)
 - HAZMAT units
- “Greater Public Health Community”
- FBI and FEMA
- CDC and EPA

Review of Grant Proposal

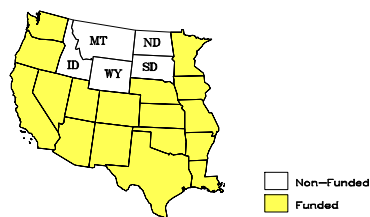
Focus Area 2: Surveillance and
Epidemiologic Capacity

(EARLY DETECTION)

Proposal highlights....

- Regional reporting

**Distribution of Nunn-Lugar-Domenici Funds
Among States in the Western U.S.**



Proposal highlights....

- Regional reporting
- Syndromic surveillance

Proposal highlights....

- Regional reporting
- Syndromic surveillance
- Animal disease integration

Proposal highlights....

- Regional reporting
- Syndromic surveillance
- Animal disease integration
- Unconventional sources of information

Overview of Proposed Activities

***Regional Surveillance for Unusual Incidents of
Unexplained Illness and Death in Humans and Animals**

1. Develop a multimedia presentation
addressing the threat of bioterrorism
in frontier America

Deliver to groups who 'need to know'

2. Establish a network of information providers

Include new & unconventional
sources of disease surveillance data

3. Set up a region-wide, toll-free, 24-hour,
incident report phone line

To report unusual incidents of
unexplained illness or death

1-800-DISEASE

4. Organize a workforce of human & animal health officials from participating states in the region

To be responsible for monitoring and reviewing incident reports

5. Create an e-mail group listserve

To facilitate communication among workforce members

6. Establish capacity for on-demand,
multi-party telephone conferencing

To enable each state to rapidly
connect with colleagues in 'real time'

7. Establish a secure, restricted-access
internet web site

To safely exchange information
among workforce members

8. Create a database containing a record of incident reports, critical information & followup findings

To be placed on web site for data entry, retrieval and analysis by workforce members

9. Program evaluation

Determine extent to which activities strengthen surveillance and epidemiologic capacity in the region

An interesting story

- The crows are dying!
- Horses in the region have neurological signs and are dying
- CNS disease in humans

New York: September 1999

- 56 cases of acute neurologic disease, 7 dead
- **St. Louis Encephalitis** virus tentatively identified
- The diagnosis came from the veterinary community: *West Nile Virus*

Lessons Learned

- Importance of integrated veterinary-human health surveillance and reporting
- Importance of disease investigation of wild as well as domestic animal outbreaks
- Importance of nontraditional sources of information
- Role of sentinel animals
- Source of the outbreak?
 - Role of the law enforcement community

Where do we go from here?

Filling in the gaps

Carcass disposal

- Q: What do you do with 40 tons of contaminated carcasses?

Disinfection / Decontamination

- Animal / human decontamination issues
- Area / carcass decontamination
- Agent specific protocols
 - Detergents
 - Oxidizing agents (Chlorine, Iodine, KMnO_4)
 - Alkali
 - Acids
 - Aldehydes
- ANTHRAX Protocol?

...diagnostic challenges

- Inadequate technology
- Inadequate bioprotection
 - Most laboratories operate on best behavior at BL2
 - Most BWAs are BL3 agents
- Inertia

#1 laboratory infection?

Laboratory support today

- LOCAL
 - Dated diagnostic technology
 - Inadequate facilities
 - Of 3 state-supported laboratories, only the MVDL routinely sees BT agents
- FEDERAL
 - Currently, all threat samples are forwarded to USAMRIID
 - Start-up BL3 lab in Logan, Utah (EPA)

Laboratory vision

- Identify and coordinate scientific resources
 - MVDL
 - DPHHS laboratory
 - State Crime Lab
 - VMB and Biofilm
 - High-Tech industry
- Facility sharing
- Expertise sharing
- Integrated, innovative training and funding

Laboratory vision

- R&D
 - Advanced diagnostics
 - Therapeutics
 - Vaccines
- User defined research focus
- Transfer of research technology to diagnostic application

Laboratory vision

- Laboratory Response Network for Biological Terrorism (LRNB)
 - BL3 facility requirement
 - Training
 - Reagents
 - Select Agent receipt
- Comprehensive preparedness through cooperation

Veterinary Contributions

- Recognize the threats of emerging disease and bioterrorism
- Be aware of the ongoing surveillance initiative
- Maintain awareness and early suspicion
 - *THESIS*: Professionals in their field of expertise “know” when something is abnormal or different
- Expand role in health community
- Report unusual incidence of disease

Veterinary Contributions

- Maintain and expand nontraditional information sources
 - Agricultural community
 - MSU Extension Agents
 - FW&P wardens and biologists
 - Humane societies
 - Pharmaceutical representatives
 - Others?

Veterinary Contributions

- Critically evaluate the program
- Contribute to program development
- Contribute to program modification
- Get a representative to the State planning table

Regional APHIS Contributions

- Integrate with ND, SD, and ID counterparts
- Train-up on the issues and plan
- Contribute to informational campaign
- Contribute to program development and execution phases
- Contribute to evaluation and modification
- Get a representative to the State planning table
- Shape USDA's support plans

Regional APHIS Contributions

- Maintain and enhance communication with other Taskforce players
- Full participation in data input and disease investigation and monitoring activities
- Liaison with FSIS counterparts
- Create a model preparedness approach to shape USDA interest, support, and funding (??)

...a word on panic

- “Any situation, no matter how insignificant, can give rise to public panic through sufficient mismanagement.”